SPH4U Name: Date: .

Young's Double Slit Drills

1 Monochromatic orange light of wavelength 597 nm is passed through a double slit of separation 0.248 mm and creates a second-order antinodal line 1.1 cm from the central maximum. How far away from the source is the screen?

2 Monochromatic orange light of wavelength 591 nm is passed through a double slit of separation 0.184 mm onto a screen 8.84 m away. How far away from the central maximum is the fourth-order minimum?

3 Monochromatic red light of wavelength 722 nm is passed through a double slit of separation 0.215 mm onto a screen 9.61 m away. How far away from the central maximum is the fifth-order antinodal line?

4 Monochromatic violet light of wavelength 441 nm is passed through a double slit of separation 0.132 mm onto a screen 8.85 m away. What order dark fringe is 13.3 cm from the central maximum?

5 Monochromatic yellow light of wavelength 577 nm is passed through a double slit of separation 0.142 mm and creates a third-order antinodal line 13.9 cm from the central maximum. How far away from the source is the screen?

6 Monochromatic orange light of wavelength 591 nm is passed through a double slit of separation 0.227 mm onto a screen 8.18 m away. What order bright fringe is 6.39 cm from the central maximum?

7 Monochromatic orange light of wavelength 601 nm is passed through a double slit of separation 0.16 mm and creates a pattern with 51.36 cm between the first and twelfth dark fringes. How far away from the source is the screen?

8 Monochromatic red light of wavelength 710 nm is passed through a double slit of separation 0.128 mm onto a screen 7.63 m away. What order minimum is 10.6 cm from the central maximum?

9 Monochromatic violet light of wavelength 400 nm is passed through a double slit of separation 0.133 mm onto a screen 3.9 m away. What order minimum is 5.28 cm from the central maximum?

10 Monochromatic yellow light of wavelength 575 nm is passed through a double slit of separation 0.233 mm onto a screen 9.55 m away. How far away from the central maximum is the fourth-order minimum?

Note: 3.4E4 = 3.4 x 10

Answers:

1. The screen is 2.29 m away. 2. The fourth-order minimum is 9.94E-2 m away from the central maximum. 3. The fifth-order antinodal line is 1.61E-1 m away from the central maximum. 4. The fifth-order dark fringe is 1.33E-1 m away from the central maximum. 5. The screen is 11.44 m away. 6. The third-order bright fringe is 6.39E-2 m away from the central maximum. 7. The screen is 11.4 m away. 8. The third-order minimum is 1.06E-1 m away from the central maximum. 9. The fifth-order minimum is 5.28E-2 m away from the central maximum. 10. The fourth-order minimum is 8.25E-2 m away from the central maximum.